

PLICUTERIA LUBOMIRSKI (ŚLÓSARSKI, 1881) (GASTROPODA: PULMONATA: HYGROMIIDAE), A FORGOTTEN ELEMENT OF THE ROMANIAN MOLLUSC FAUNA, WITH NOTES ON THE CORRECT SPELLING OF ITS NAME

BARNA PÁLL-GERGELY^{1,*}, ROLAND FARKAS², TAMÁS DELI³, FRANCISCO WELTER-SCHULTES⁴

¹ Department of Biology, Shinshu University, Matsumoto 390-8621, Japan (e-mail: pallgergely2@gmail.com)

² Aggtelek National Park Directorate, Tengersizem oldal 1, H-3758 Jósavafő, Hungary
(e-mail: farkasro@yahoo.com)

³ Békés Megyei Múzeumok Igazgatósága, Gyulai u 1., H-5600 Békéscsaba, Hungary (e-mail: deli@bmmi.hu)

⁴ Zoologisches Institut, Berliner Strasse 28, 37073 Göttingen, Germany (e-mail: fwelter@gwdg.de)

* corresponding author

ABSTRACT: In this paper two new localities of the hygromiid land snail *Plicuteria lubomirski* (Ślósarski, 1881) are reported from Romania (Suceava and Harghita Counties). Its presence at the Lacu Roșu (Gyilkos-tó) area represents the southeasternmost occurrence of the species. The only sample of *P. lubomirski* hitherto reported from Romania (leg. JICKELI in 1888 at Borsec Bai) seems to be lost from museum collections. The northern Carpathian distributional type is suggested for the species. The nomenclatural problem regarding the spelling of the specific name (i.e. *lubomirskii* or *lubomirski*) is discussed. The original, but less frequently used spelling (*lubomirski*) is suggested based on our understanding of the regulations of the ICZN.

KEY WORDS: Carpathian species, faunistics, biogeography, *Trochulus*, anatomy

INTRODUCTION

Plicuteria lubomirski (Ślósarski, 1881) (often referred to as *Trochulus*) is a Carpathian species reported from Austria (KLEMM 1973, but also see REISCHÜTZ & REISCHÜTZ 2007), the Czech Republic (northern Bohemia, northern and eastern Moravia; increase eastward, see LOŽEK 1956 and PROČKÓW 2009), southern Poland (RIEDEL 1988, WIKTOR 2004), northern Hungary (FEHÉR & GUBÁNYI 2001, PINTÉR & SUARA 2004), south-eastern Germany (SCHNIEBS & REISE 1997), western Ukraine (POLIŃSKI 1924, LIKHAREV & RAMMELMEJER 1952, BAIDASHNIKOV 1996, FEHÉR 2011, GURAL-SVERLOVA & GURAL 2012) and Slovakia (LISICKÝ 1991, VAVROVA 2009). The species is widespread and frequent in the latter country which can be interpreted as the centre of distribution.

KIMAKOWICZ (1890) was the first who reported the species from the area of the present Romania based on specimens collected by C. F. JICKELI in 1888 “in der

Umgebung des Bades Borszék” (=around Borsec Bai). This record was later mentioned by SOÓS (1943) and GROSSU (1983). No additional data on the Romanian occurrence of the species were published to our knowledge. According to DANCE (1986), the collection of JICKELI is in the Berlin Museum (=MNB) or in the Hermannstadt (=Sibiu) Museum (=NHMS). JICKELI’s specimens however have not been found in these museums (NHMS: ANA-MARIA MESAROS pers. comm., MNB: CHRISTINE ZORN, pers. comm.). This single, very old record very far from the known distribution of the species makes the occurrence of the species doubtful in Romania, especially with lost voucher specimens. Moreover, this single locality was omitted in the revision of PROČKÓW (2009). Therefore we find it important to summarise the data on the distribution of *P. lubomirski* by reporting the species from two new Romanian localities.

MATERIAL AND METHODS

The nomenclature of species mentioned is according to FAUNA EUROPAEA (2012) with the exception of *Plicuteria lubomirski*. Although the most recent taxonomic revision (PROČKÓW 2009) placed *P. lubomirski* in the genus *Trochulus*, molecular results published by PFENNINGER et al. (2005) show that this species is only distantly related to that genus. We use here the generic name *Plicuteria* Shileyko 1978, which was described as a monotypic genus. The spelling of the specific name is contradictory and discussed here following the ICZN Code (RIDE et al. 1999).

Two specimens from the Lacu Roșu area were anatomically investigated.

Abbreviations used in the text: HNHM – Hungarian Natural History Museum, Budapest, Hungary; MD – MICHAEL DUDA Collection, Vienna, Austria; MNB – Museum für Naturkunde, Berlin, Germany; NHMS – Natural History Museum, Sibiu, Romania; NHMW – Naturhistorisches Museum Wien, Vienna, Austria; PGB – BARNA PÁLL-GERGELY Collection, Mosonmagyaróvár, Hungary.

RESULTS AND DISCUSSION

DISTRIBUTION

Plicuteria lubomirski was found in two new localities in Romania: (1) Jud. Suceava, Munții Rarău, south of Câmpulung Moldovenesc, along the stream Izvorul Alb, leg. B. PÁLL-GERGELY, 25.06.2005. (9 shells); (2)

Jud. Harghita, Lacu Roșu (Gylkos-tó), along the Gylkos-patak (stream), between the lake and the first limestone rocks reaching the highway, GPS position: 46.795377°N, 25.800018°E, leg. B. PÁLL-GERGELY, 15.08.2005, PGB/2; 15.08.2006, PGB/5; 20.05.2012, HNHM 98756/5, MD/2, NHMS/3, PGB/46 (Figs



Fig. 1. Shell (HNHM 98756) and live animal of *Plicuteria lubomirski* (Ślósarski, 1881). Collection data: Romania, Jud. Harghita, Lacu Roșu (Gylkos-tó), along the Gylkos-patak (stream), between the lake and the first limestone rocks reaching the highway, 46.795377°N, 25.800018°E, leg. B. PÁLL-GERGELY, 20.05.2012. Scale bar (for the shell photos) represents 5 mm. Photos: B. PÁLL-GERGELY (shell), T. DELI (live animal)

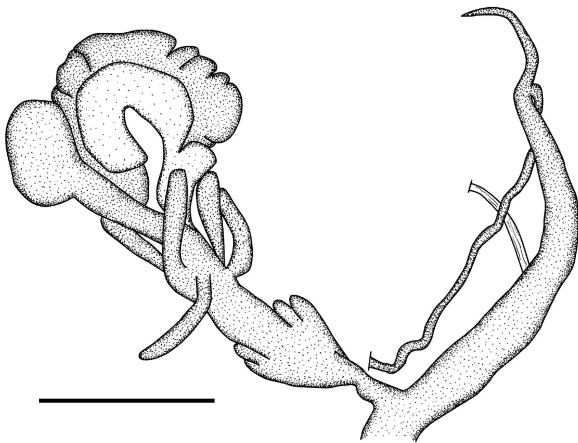


Fig. 2. Genital anatomy of *Plicuteria lubomirski* (Ślósarski, 1881). For collection data see Fig. 1. Scale represents 5 mm

1–2). The second locality is the southeasternmost locality of the species (Fig. 3). The species was frequent on both locations. Live animals were in most cases crawling on the vegetation or on both sides of large leaves (e.g. *Petasites*). The anatomy (Fig. 2) of the investigated specimens agrees with the results of SHILEYKO (1978) and PROĆKÓW (2009).

Biogeographically *Plicuteria lubomirski* is classified as a Carpathian species by KERNEY et al. (1983) and PROĆKÓW (2009). We find it reasonable to typify it as a northern Carpathian species because it is known from several localities in the Western Carpathians (which is identical to the Northern Carpathian biogeographical district in the sense of SOÓS 1943)

and the northern half of the Eastern Carpathians (with disjunct populations relatively far from the chain of the Carpathians), was not recorded from the southern half of the Eastern Carpathian chain, and is missing from the Southern Carpathian mountains. The same distribution type can be applied for instance to the clausiliids *Vestia* (*Vestia*) *gulo* (E. A. Bielz), *Alinda* (*Pseudalinda*) *stabilis* (L. Pfeiffer), *Macrogastera* (*Pyrostoma*) *tumida* (Rossmässler), and the hygromiid *Perforatella dibothrion* (M. von Kimakowicz) (for distributional data see SOÓS 1943 and GROSSU 1981).

SPELLING OF THE SPECIFIC NAME

ANTONI ŚLÓARSKI (1881) created the name “*Helix* (*Fruticicola*) *Lubomirski*” in order to honour his fellow malacologist Prince WŁADYSŁAW LUBOMIRSKI. Under Art. 28 of the ICZN Code this is to be corrected to *Helix* (*Fruticicola*) *lubomirski* (with lower-case initial letter of the specific name). The name is not very frequently used in the literature and the specific name (“specific epithet”) was subsequently spelled as *lubomirskii* and *lubomirski*.

A non-exhaustive literature survey of the usage of the two different types of spelling demonstrated that *lubomirski* was used much less frequently (ŚLÓARSKI 1881, JAECKEL 1939, GROSSU 1983, BARGA-WIEĆLAWSKA et al. 2002, WELTER-SCHULTES 2012) than *lubomirskii* (KIMAKOWICZ 1890, POLIŃSKI 1914, 1917, 1919, 1924, WAGNER 1915, DYRDOWSKA 1926, GEYER 1927, MŁODZIANOWSKA-DYRDOWSKA 1928,

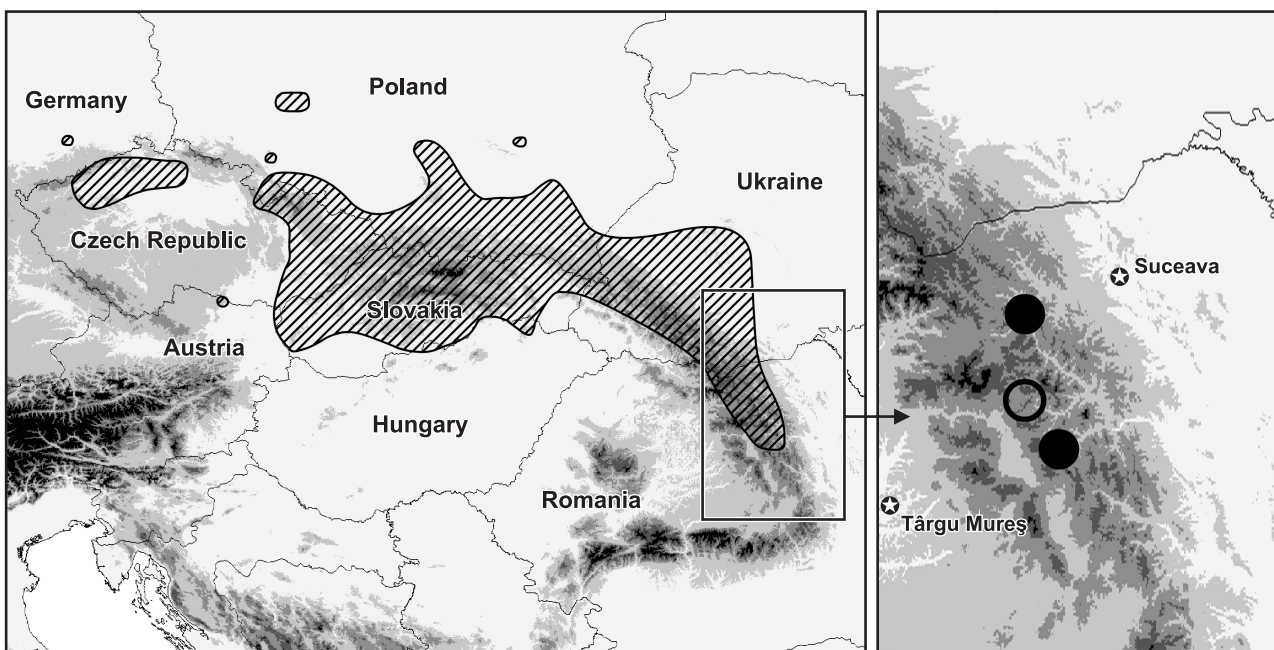


Fig. 3. Map showing distributional data of *Plicuteria lubomirski* (ŚLÓARSKI, 1881). After LISICKÝ (1991), BAIKASHNIKOV (1996), SCHNIEBS & REISE (1997), PINTÉR & SUARA (2004), REISCHÜTZ & REISCHÜTZ (2007), PROĆKÓW (2009), VAVROVA (2009) and data published here. The enlarged map shows the Romanian distribution; black circle: new data, hollow circle: data published by KIMAKOWICZ (1890)

URBAŃSKI 1932, 1957, EHRMANN 1933, KAZNOWSKI 1938, 1939, KERNEY et al. 1983, RIEDEL 1988, FECHTER & FALKNER 1990, BAIDASHNIKOV 1996, PAWŁOWSKA & POKRYSZKO 1998, FEHÉR & GUBÁNYI 2001, JUŘIČKOVÁ et al. 2001, 2005, 2006, PINTÉR & SUARA 2004, WIKTOR 2004, PFENNINGER et al. 2005, SVERLOVA 2006, ČEJKA et al. 2007, EGOROV 2008, PROČKÓW 2009, SYSOEV & SHILEYKO 2009, KORALEWSKA-BATURA et al. 2010, BALASHOV & GURAL-SVERLOVA 2012, FARKAS & PÁLL-GERGELY 2012, FAUNA EUROPAEA 2012), whereas SHILEYKO (1978) used both spellings.

Under Article 31.1 of the Code a species-group name formed from a personal name may either be a noun in the genitive case (this would give *lubomirskii*), or a noun in the nominative case (this would give *lubomirski*), or an adjective or participle (this would result in names like *lubomirskiana*, *lubomirskiella* etc.). In the original source the name was a noun given in the nominative case. This was a correct procedure under Art. 31.1, however it is not recommended to do this today (Recommendation 31A recommends taxonomists to avoid establishing such names). The reason why the author decided to use this spelling in 1881 remains obscure. *H. lubomirski* was the original spelling (Article 32.2), and it cannot be corrected to *lubomirskii* under Article 32.5 because it was not demonstrably incorrect as provided in Article 32.5; the only Article in the Code which would give us the power to correct such a spelling afterwards. The conditions of Article 32.5.1 and 32.5.2.1 are not met. The name was correctly formed under Article 31.1, it was not a printer's error or error in typesetting, and it was not corrected in a corrigendum.

Article 33.4 rules cases of -i/-ii endings, but does not come into effect because the conflict between -i and -ii in this Article is of a different nature and would not apply to our case. Article 33.4 rules that a name *bennetti* (the genitive case of BENNETT) and another name *bennettii* (the genitive case of the latinised name BENNETTIUS) could not be regarded as emendations of each other. The latinised form of LUBOMIRSKI would be LUBOMIRSKIUS. Both names (LUBOMIRSKI and LUBOMIRSKIUS) would give *lubomirskii* in the genitive case.

Since Article 33.4 does not apply, the spelling *lubomirskii* could either be an incorrect subsequent spelling, or an unjustified emendation. We check as many sources as possible, but were unable to find a publication which has used the spelling *lubomirskii* as an emendation of *lubomirski* (Art. 33.2); but this question is irrelevant in our case (see below).

Article 33 could be employed to regard the misspelling as the correct name, if this is in “prevailing usage” (Article 33.2.3.1 if an unjustified emendation, Article 33.3.1 if an incorrect subsequent spelling). If regarded as such, it would be combined with the original author and the original date of publication (Arti-

cle 33.2.3.1, 33.3.1). The term “prevailing usage” is insufficiently defined in the Code (Glossary: “that usage of the name which is adopted by at least a substantial majority of the most recent authors concerned with the relevant taxon, irrespective of how long ago their work was published”). The definition in the Glossary gives no idea how many authors should be involved, which time spans would be admissible, how many publications should contain the name, which proportion would be regarded as a “substantial” majority, and which authors would qualify for the term “most recent” authors. It is not directly demanded that the concerned authors needed to have published the name.

In the intention to determine “prevailing usage” for three rarely used names of Italian terrestrial gastropods established by STROBEL (1850) (*Pomatias Porro*, *Clausilia Balsamo* and *Clausilia Strobel*), HAUSDORF (2012) determined proportions of usages of variant spellings used in the literature. He argued that emended spellings were in prevailing usage under Article 33.2.3.1 because they were used in the emended forms in 9, 7 and 17 publications in the past 50 years (and the original forms were used in 0, 4 and 8 cases respectively, in the same period). He also listed the names of five selected recent authors of malacological works in favour of the emended forms, and one person against (the persons did not necessarily publish the concerned names). The base of HAUSDORF's (2012) selection of relevant taxonomists was personal and we regard such a procedure as questionable. This shows that inserting this Article in the Code's 4th edition (RIDE et al. 1999) (it was not contained in the previous Code editions; see RIDE et al. 1985) yielded probably undesired effects. It has initiated endless disputes on correct spellings of names and involves also social effects inside the scientific community. Who is granted the right to be selected as a relevant author to be cited at such an occasion? Recent authors from Italy and Switzerland (BODON, BOSCHI and NARDI) who had mentioned the concerned species in 2011 and were cited in HAUSDORF's (2012) paper were not included in the list of “most recent authors”. BODON used the emended spellings (NARDI & BODON 2011), BOSCHI (2011) the original spelling, NARDI used both spellings in different publications (NARDI 2011, NARDI & BODON 2011). With every new publication the proportions of the usages would change (but this could be regarded as irrelevant because the persons and not the publications should count), the composition of the most recent authors would change; dead authors would eventually have to be removed from the list, etc.

What to do with co-authors? In HAUSDORF's (2012) list, seven co-authors of a book preferred the original spelling (TURNER et al. 1998). Adding these to the list of author proportions would provoke an en-



tirely different result and anything else but a “substantial majority” for the emended spellings.

The reasons behind inserting this Article in the 4th Code edition are speculative and were nowhere documented or explained, but the examples (Article 33.2.3.1 *Helophorus*, Article 33.3.1 *Trypanosoma brucei*) suggest that the new rules were thought to be applied for very frequently used names, which are cited hundreds or thousands of times each year. The examples suggest that the rules were probably not established to determine the preferred spelling of a name that is cited less than 25 times in 50 years. Consequently, it might probably be best to use the original spellings of the quite rarely used mollusc names.

REFERENCES

- BALASHOV I., GURAL-SVERLOVA N. 2012. An annotated checklist of the terrestrial molluscs of Ukraine. *J. Conch.* 41: 91–109.
- BARGA-WIĘCŁAWSKA J., CZERWIK-MARCINKOWSKA J., MROZIŃSKA-BRODA T. 2002. Monitoring przestrzeni pohutniczej Zespołu Wielkopiecowego w Starachowicach z wykorzystaniem glonów i ślimaków jako biowskaźników stanu środowiska przyrodniczego. *Regionalny Monitoring Środowiska Przyrodniczego* 3: 71–74.
- BAIDASHNIKOV A. A. 1996. Nazemnaya malakofauna ukraïnskogo Poles'a. 2. Formirovanie sovremennykh malakokompleksov. *Vest. Zool.* 3: 3–12.
- BOSCHI C. 2011. Die Schneckenfauna der Schweiz. Ein umfassendes Bild- und Bestimmungsbuch. Haupt., Bern, Stuttgart, Wien.
- ČEJKA T., DVOŘÁK L., HORSÁK M., ŠTEFFEK J. 2007. Checklist of the molluscs (Mollusca) of the Slovak Republic. *Folia Malacol.* 15: 49–58.
- DANCE S. P. 1986. A history of shell collecting. E. J. Brill, Leiden.
- DYRDOWSKA M. 1926. Les mollusques terrestres testacés de Posnanie et les particularités de leur distribution géographique. *Bull. Soc. Amis Sci. Poznań* B 2: 60–72.
- EGOROV R. 2008. Treasure of Russian shells. Supplement 5. Illustrated catalogue of the recent terrestrial molluscs of Russia and adjacent regions. Colus-Doverie LTD, Moscow.
- EHRMANN P. 1933. Mollusken (Weichtiere). In: *Die Tierwelt Mitteleuropas*, II(1), Leipzig.
- FARKAS R., PÁLL-GERGELY B. 2012. The first record of *Trochulus bielzi* (E. A. Bielz, 1860) in Hungary (Zemplén Mountains) with notes on the anatomy of some *Trochulus* species (Gastropoda: Pulmonata: Hygromiidae). *Folia Malacol.* 20: 81–85.
- FAUNA EUROPAEA 2012. Fauna Europaea version 2.3. Web Service available online at <http://www.faunaeur.org> (assessed 07 November 2012).
- FECHTER R., FALKNER G. 1990. Weichtiere. Europäische Meers- Und Binnenmollusken. Mosaik Verlag, München.
- FEHÉR Z. 2011. *Trochulus lubomirskii*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.1. <www.iucnredlist.org>. Downloaded on 04 August 2012.
- FEHÉR Z., GUBÁNYI A. 2001. The catalogue of the Mollusca Collection of the Hungarian Natural History Museum. Magyar Természettudományi Múzeum, Budapest.
- GEYER D. 1927. Unsere Land- Und Süßwasser-Mollusken. Dritte, vollständig neubearbeitete Auflage. Stuttgart.
- GROSSU A. V. 1981. Gastropoda Romaniae, 3. Suprafamilie Clausiliacea și Achatinacea. Universitatea din București, București.
- GROSSU A. V. 1983. Gastropoda Romaniae 4. Ordo Stylommatophora. Suprafam.: Arionacea, Zonitacea, Ariophantacea și Helicacea. Editura Litera, București.
- GURAL-SVERLOVA N. V., GURAL R. I. 2012. Scientific collections of State Natural History Museum of NAS of Ukraine: Malacological fund, Lviv.
- HAUSDORF B. 2012. On the spelling of some dedication names introduced by Strobel for south Alpine terrestrial snails (*Cochlostoma*, *Charpentieria*, *Neostyriaca*). *J. Conch.* 41: 259–262.
- JAECKEL S. 1939. Zur Kenntnis der schlesischen Mollusken. *Arch. Moll.* 71: 154–156.
- JUŘIČKOVÁ L., BERAN L., DVOŘÁK L., HLAVÁČ J. Č., HORSÁK M., HRABÁKOVÁ M., MALTZ T., POKRYSZKO B. M. 2005. Mollusc fauna of the Rychlebské Hory (Czech Republic). *Folia Malacol.* 13: 9–23.
- JUŘIČKOVÁ L., HORSÁK M., BERAN L. 2001. Check-list of the molluscs (Mollusca) of the Czech Republic. *Acta Soc. Zool. Bohem.* 65: 25–40.
- JUŘIČKOVÁ L., LOŽEK V., ČEJKA T., DVOŘÁK L., HORSÁK M., HRABÁKOVÁ M., MÍKOVCOVÁ A., ŠTEFFEK J. 2006. Molluscs of the Bukovské vrchy mts in the Slovakian part of The východné Karpaty Biosphere Reserve. *Folia Malacol.* 14: 203–215.

- KAZNOWSKI K. 1938. Materiały do fauny malakologicznej Gór Świętokrzyskich. In: Sprawozdania współpracowników Sekcji zoologicznej Oddziału Krakowskiego. Spraw. Kom. Fizjogr. Kraków 71: 32–33.
- KAZNOWSKI K. 1939. Materiał mięczaków z mało pod tym względem zbadanego terenu Gór Świętokrzyskich. In: Sprawozdania współpracowników Sekcji zoologicznej Oddziału Krakowskiego. Spraw. Kom. Fizjogr. Kraków 72: 29.
- KERNEY M. P., CAMERON R. A. D., JUNGBLUTH J. H. 1983. Die Landschnecken Nord-und Mitteleuropas. Paul Parey, Hamburg und Berlin.
- KIMAKOWICZ M. VON 1890. Beitrag zur Molluskenfauna Siebenbürgens. II. Nachtrag. Verh. Mitt. Siebenb. Ver. Naturwiss. Hermannstadt 40: 1–113.
- KLEMM W. 1973. Die Verbreitung der rezenten Land- Gehäuse-Schnecken in Österreich. Denkschriften der Österreichischen Akademie der Wissenschaften 117: 1–503.
- KORALEWSKA-BATURA E., GOŁDYN B., SZYBIAK K., BŁOSZYK J. 2010. Materials to the knowledge of molluscs of Wielkopolska. II. Checklist. Folia Malacol. 18: 29–41. doi: 10.2478/v10125-010-0004-1
- LIKHAREV I. M., RAMMELMEJER E. S. 1952. Nazemnye mollyuski fauny SSSR. Opredeliteli po Faune SSSR, Izdavaemye Zoologicheskimi Institutom Akademii Nauk SSSR 43. Moskva, Leningrad.
- LISICKI M. J. 1991. Mollusca Slovenska. VEDA, Bratislava.
- LOŽEK V. 1956. Klíč Československých měkkýšů. Vydavatelstvo Slovenskej Akadémie Vied, Bratislava.
- MŁODZIANOWSKA-DYRDOWSKA M. 1928. Ślimaki lądowe skorupowe w Poznańskim i właściwości ich rozmieszczenia. Pr. Kom. Mat.-Przyr. PTPN, B, Poznań 4: 1–96.
- NARDI G. 2011. Clausiliidae (Gastropoda, Pulmonata) from Lombardy (northern Italy), with the description of a new subspecies. Basteria 75: 95–103.
- NARDI G., BODON M. 2011. Una nuova specie di *Testacella* Lamarck, 1801, per l'Italia settentrionale (Gastropoda: Pulmonata: Testacellidae). Boll. Malacol. 47: 150–164.
- PAWŁOWSKA E., POKRYSZKO B. M. 1998. Why are terrestrial gastropods of Poland threatened? Folia Malacol. 6: 63–71.
- PFENNINGER M., HRABÁKOVÁ M., STEINKE D., DÉPRAZ A. 2005. Why do snails have hairs? A Bayesian inference of character evolution. BMC Evol. Biol. 5: 59.
- PINTÉR L., SUARA R. 2004. Magyarországi puhatestűek katalógusa hazai malakológusok gyűjtései alapján. Hungarian Natural History Museum, Budapest.
- POLIŃSKI W. 1914. Ślimaki Ojcowa. Spraw. Kom. Fizyogr. Kraków 48: 16–50.
- POLIŃSKI W. 1917. Materiały do fauny malakozoologicznej Królestwa Polskiego, Litwy i Polesia. Prace Wyzd. III Tow. Nauk. Warsz. 27: 1–130.
- POLIŃSKI W. 1919. Rozsiedlenie geograficzne Helicidów w Polsce (szkic zoogeograficzny z mapką). Przegl. Geogr. Warszawa 1: 269–280.
- POLIŃSKI W. 1924. Anatomisch-systematische und zoogeographische Studien über die Heliciden Polens. Bull. Acad. Polon. Sci. Lett. Cl. Math. Nat. B. 1924 (2): 131–279.
- PROČKÓW M. 2009. The genus *Trochulus* Chemnitz, 1786 (Gastropoda: Pulmonata: Hygromiidae) – a taxonomic revision. Folia Malacol. 17: 101–176.
- REISCHÜTZ A., REISCHÜTZ P. L. 2007. Rote Liste der Weichtiere (Mollusca) Österreichs. In: ZULKA P. (ed.). Rote Listen gefährdeter Tiere Österreichs. Checklisten, Gefährdungsanalysen, Handlungsbedarf. Teil 2. Grüne Reihe des BLFUW, Wien, Böhlauverlag, pp. 363–433.
- RIDE W. D. L., SABROSKY C. W., BERNARDI G., MELVILLE R. V., CORLISS J. O., FOREST J., KEY K. H. L., WRIGHT C. W. 1985. Code International de Nomenclature Zoologique. Troisième édition adopté par la XXe Assemblée Générale de l'Union Internationale des Sciences Biologiques. International Code of Zoological Nomenclature. Third edition adopted by the XX General Assembly of the International Union of Biological Sciences. International Trust for Zoological Nomenclature, London.
- RIDE W. D. L., COGGER H. G., DUPUIS C., KRAUS O., MINELLI A., THOMPSON F. C., TUBBS P. K. 1999. International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences. Code International de Nomenclature Zoologique. Quatrième édition. International Trust for Zoological Nomenclature, London.
- RIEDEL A. 1988. Ślimaki lądowe. Gastropoda terrestria. Katalog fauny Polski 36, PWN, Warszawa.
- SCHNIEBS K., REISE H. 1997. Auswertung des Herbsttreffens-Ost der DMG, 18.-20.10.1996 in Ottendorf (Sachsen). Erstfunde von *Trichia lubomirskii* und *Arion alpinus*. Mitt. d. Deutsch. Malakozool. Ges. 59: 33–36.
- SHILEYKO A. A. 1978. On the systematics of *Trichia* s. lat. (Pulmonata: Helicoidea: Hygromiidae). Malacologia 17: 1–56.
- ŚLÓSARSKI A. 1881. Materiały do fauny malakologicznej Królestwa Polskiego. Pamiętnik Fizyograficzny, Warszawa 1: 292–320.
- SOÓS L. 1943. A Kárpát-medence Mollusca faunája. Hungarian Academy of Sciences, Budapest.
- STROBEL P. 1850. Note malacologiche d'una gita in Valbrenbana nel Bergamasco. Per servire ad una topografia generale delle provincie Lombarde. Giornale dell'Imperiale Reale Istituto Lombardo di Scienze, Lettere e Arti e Biblioteca Italiana (Nuova Serie) 2: 59-70, 114-127, 250–266.
- SVERLOVA N. V. 2006. O rasprostraneni nekotorykh vidov nazemnykh mollyuskov na territorii Ukrainy. Ruthenica 16: 119–139.
- SYSOEV A., SHILEYKO A. A. 2009. Land snails and slugs of Russia and adjacent countries. Pensoft, Sofia.
- TURNER H., KUIPER J. G. J., THEW N., BERNASCONI R., RÜETSCHLI J., WÜTHRICH M., GOSTELI, M. 1998. Mollusca Atlas. Atlas der Mollusken der Schweiz und Liechtensteins. Fauna Helvetica 2: 1–527.
- URBAŃSKI J. 1932. Godne ochrony gatunki i zespoły mięczaków województwa poznańskiego. Ochr. Przyr. Warszawa 12: 37–44.
- URBAŃSKI J. 1957. Krajowe ślimaki i małże. Klucz do oznaczania wszystkich gatunków dotąd w Polsce wykrytych. PZWS, Warszawa.



- VAVROVA L. 2009. Ecosozological evaluation of molluscs of Slovakia by using Geographical information system (GIS). PhD.-thesis, UEL SAV Zvolen.
- WAGNER A. J. 1915. Beitrage zur Anatomie Und Systematik der Stylommatophoren aus dem Gebiete der Monarchie Und der anrenzenden Balkanländer. Denkschr. Math.-Nat. Kl. Akad. Wiss. Wien. 91: 429–498.
- WELTER-SCHULTES F. W. 2012. European non-marine molluscs, a guide for species identification. Planet Poster Editions, Göttingen.
- WIKTOR A. 2004. Ślimaki łądowe Polski. Mantis, Olsztyn.
- Received: November 26th, 2012*
Revised: January 9th/13th, 2013
Accepted: February 3rd, 2013



